



Methodological Evaluation and Risk Reduction in Ethiopian District Hospital Systems

A Longitudinal Panel-Data Analysis

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ABSTRACT

Background: District hospitals in sub-Saharan Africa face systemic challenges in patient safety and operational risk management. Existing evaluations often rely on cross-sectional data, which fail to capture temporal dynamics and may misattribute causality in system interventions.

Purpose and objectives: This study aimed to methodologically evaluate a multi-component intervention in district hospital systems and quantify its effect on clinical risk reduction using a longitudinal panel-data framework.

Keywords: District hospitals, Sub-Saharan Africa, Panel-data analysis, Patient safety, Risk management, Health systems evaluation, Longitudinal study

Article Highlights

- Fixed-effects panel model isolates intervention impact from time-invariant confounders.
- 23.5% reduction in aggregate clinical risk scores observed in treated facilities.
- Study provides a robust methodological framework for evaluating complex health system interventions.
- Findings support scale-up of structured audit cycles and supply chain protocols.

Methodological Contribution

This study offers a novel application of econometric panel-data methods to health systems evaluation, generating robust causal evidence for intervention effectiveness in resource-constrained settings.

This analysis advances methodological rigor in health systems research for sub-Saharan Africa.

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